Original Research Paper Anaesthesiology

CARDIAC ARREST FOLLOWING NEOSTIGMINE IN PATIENTS ON BETA BLOCKER - A CASE REPORT

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ABSTRACT Neostigmine (anticholinesterases) is long been used to antagonize the effect of Non-depolarizing muscle relaxants after surgery. Sinus bradycardia is the most common arrythmias associated neostigmine. We report a 50 years old female with diagnosis of fracture shaft humerus posted for open reduction and internal fixation. She was on beta blocker Atenolol 50mg once a day from two years prior to date of trauma. After completion of surgery reversal was planned when patient had adequate respiratory efforts. Injection neostigmine mixed with atropine was administered to the patient. She immediately developed severe bradycardia and heart rate dropped to 30 beats/minutes and further to 20 beats/ minutes and near asystole. Immediately 1.2 mg of atropine was given and heart rate restored to 78 beats/ minutes. By your esteemed journal we want to convey that all anaesthetist should be familiar about the side effects of the drugs like neostigmine which can be life threatening.

KEYWORDS : Neostigmine; betablocker; cardiac arrest.

INTRODUCTION:

Neostigmine (anticholinesterases) is long been used to antagonize the effect of Non-depolarizing muscle relaxants after surgery. Cautious use of neostigmine is recommended in conditions like epilepsy, asthma, hyperthyroidism, cardiac arrythmias, bradycardia etc. Sinus bradycardia is the most common arrythmias associated neostigmine but rarely can result in AV block, nodal rhythms, non-specific ECG changes and cardiac arrest.[1]

CASE SUMMARY:

We report a 50 years old female with diagnosis of fracture shaft humerus posted for open reduction and internal fixation. On preoperative examination patient was found to be hypertensive and was on beta blocker Atenolol 50mg once a day from two years prior to date of trauma. Her preoperative blood pressure was 140/90 and pulse rate 68 beats/ minute. All the investigations including ECG were within normal limits. After the standard induction patient was intubated and maintained on O_2, N_2O and isoflurane mixture and atracurium given as a non depolarizing muscle relaxant. Surgery continued for one and a half hour and intraoperative period showed no fluctuations in heart rate and blood pressure. After completion of surgery reversal was planned when patient had adequate respiratory efforts. Injection neostigmine mixed with atropine was administered to the patient. She immediately developed severe bradycardia and heart rate dropped to 30 beats/minutes and further to 20 beats/ minutes and near asystole. Immediately 1.2 mg of atropine was given and CPR was initiated. After two minutes patient was revived and heart rate restored to 78 beats/ minutes.

DISSCUSSION:

Neostigmine inhibits the enzyme cholinesterases, resulting in accumulation of Acetylcholine (Ach) at cholinergic receptors. As the concentration of muscle relaxant decreases at the neuromuscular junction due to hydrolysis and redistribution and accumulated Ach competes with the relaxants to reverse the residual neuromuscular blockade.[2] Cardiovascular effect of neostigmine depends on stimulation of muscuranic and nicotinic receptors.[3] Arrythmias and cardiac arrest have been reported following the administration of neostigmine.[4-6] Injection of mixture of neostigmine and atropine impairs cardiac baroreflex senstivity. Parasympathetic modulation of heart rate is said to be impaired for at least 120 minutes after administration of drug.[3,7] Neostigmine and atropine when given in combination vagolytic effect of atropine precede the muscuranic effects of neostigmine by 1-2 minutes but when given in small doses produces significant decrease in heart rate and large doses can result in dysrrhymias.[3] Cautious use of neostigmine is recommended when patients are on drugs like beta blockers, calcium channel bockers and digoxin.[1]

CONCLUSION:

We want to convey that all anaesthetist should be familiar about the side effects of the drugs like neostigmine which can be life threatening. We recommend the slow administration of the drug over the period of 5 minutes and its cautious use in patients on beta-blocker. Reversal in such patients can be alternatively tried with the newer drugs like "gamma cyclodextrin".

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